

- 10 -

WHAT IS CLAIMED IS:

1. A hydraulic turbine adapted to introduce oxygen into water flowing through a water passageway of the turbine, the turbine comprising:
 - a rotatably mounted runner having a crown, a band substantially concentric with the crown, and a plurality of runner blades extending between the crown and the band, the band having an upstream end portion and a downstream end portion;
 - a stationary discharge ring substantially concentric with the band and spaced outwardly therefrom;
 - a circumferential chamber formed between the band and the stationary discharge ring, the circumferential chamber having a gas admission aperture for receiving an oxygen containing gas into the chamber;
 - an upper seal positioned adjacent the upstream end portion of the band between the band and the stationary discharge ring to limit water leakage into a circumferential chamber;
 - a lower seal positioned adjacent the downstream end portion of the band between the band and the stationary discharge ring to reduce undesirable escape of oxygen containing gas and water from the chamber between the band and the stationary discharge ring; and,
 - the downstream end portion of the band having a plurality of spaced apart vanes providing outlet passageways between the vanes in fluid communication with the circumferential chamber and the water passageway, the vanes being configured to rotate with the band and draw the oxygen containing gas and water from the chamber through the outlet passageways and into the water passageway.
2. The hydraulic turbine of claim 1 wherein the lower seal is positioned directly adjacent the vanes and the outlet passageways extend between the band and the lower seal.

- 11 -

3. The hydraulic turbine of claim 1 wherein the downstream end portion of the band has a circumferential band portion surrounding the vanes whereby the outlet passageways are contained within and extend through the lower band portion, and the lower seal being disposed between the circumferential band portion and the stationary discharge ring.

4. The hydraulic turbine of claim 1 wherein the oxygen containing gas is ambient air.

5. The hydraulic turbine of claim 4 wherein the ambient air is supplied under pressure.

6. The hydraulic turbine of claim 2 wherein the oxygen containing gas is ambient air.

7. The hydraulic turbine of claim 6 wherein the ambient air is supplied under pressure.

8. The hydraulic turbine of claim 3 wherein the oxygen containing gas is ambient air.

9. The hydraulic turbine of claim 8 wherein the ambient air is supplied under pressure.

10. The hydraulic turbine of claim 1 wherein the turbine further includes a draft tube downstream of the band, the draft tube having an inner wall adjacent the band, and the outlet passageways of the downstream band portion adjacent the water passageway being positioned inwardly of the inner wall of the draft tube adjacent the band.

11. The hydraulic turbine of claim 1 wherein the outlet passageways passing through the downstream end portion of the band have inlet openings and outlet openings, the inlet openings communicating with the chamber and the discharge openings communicating with the water passageway.

12. The hydraulic turbine of claim 2 wherein the outlet passageways passing through the downstream end portion of the band have inlet openings and outlet openings, the inlet openings communicating with the chamber and the discharge openings communicating with the water passageway.

- 12 -

13. The hydraulic turbine of claim 3 wherein the outlet passageways passing through the downstream end portion of the band have inlet openings and outlet openings, the inlet openings communicating with the chamber and the discharge openings communicating with the water passageway.

14. The hydraulic turbine of claim 1 wherein the upper seal is configured such that the circumferential chamber remains substantially unflooded during turbine operation.

15. The hydraulic turbine of claim 14 wherein the upper seal is configured to maintain a volume of water in the circumferential chamber in the range of about 20% to 30% of the total volume of the chamber.

16. The hydraulic turbine of claim 14 wherein the lower seal is positioned directly adjacent the vanes and the outlet passageways extend between the band and the lower seal.

17. The hydraulic turbine of claim 14 wherein the downstream end portion of the band has a circumferential band portion surrounding the vanes whereby the outlet passageways are contained within and extend through the lower band portion, and the lower seal being disposed between the circumferential band portion and the stationary discharge ring.

18. The hydraulic turbine of claim 14 wherein the oxygen containing gas is ambient air.

19. The hydraulic turbine of claim 18 wherein the ambient air is supplied under pressure.

20. The hydraulic turbine of claim 16 wherein the oxygen containing gas is ambient air.

21. The hydraulic turbine of claim 20 wherein the ambient air is supplied under pressure.

22. The hydraulic turbine of claim 17 wherein the oxygen containing gas is ambient air.

23. The hydraulic turbine of claim 22 wherein the ambient air is supplied under pressure.

- 13 -

24. The hydraulic turbine of claim 14 wherein the turbine further includes a draft tube downstream of the band, the draft tube having an inner wall adjacent the band, and the outlet passageways of the downstream band portion adjacent the water passageway being positioned inwardly of the inner wall of the draft tube adjacent the band.

25. The hydraulic turbine of claim 14 wherein the outlet passageways passing through the downstream end portion of the band have inlet openings and outlet openings, the inlet openings communicating with the chamber and the discharge openings communicating with the water passageway.

26. The hydraulic turbine of claim 16 wherein the outlet passageways passing throughout the downstream end portion of the band have inlet openings and outlet openings, the inlet openings communicating with the chamber and the discharge openings communicating with the water passageway.

27. The hydraulic turbine of claim 17 wherein the outlet passageways passing through the downstream end portion of the band have inlet openings and outlet openings, the inlet openings communicating with the chamber and the discharge openings communicating with the water passageway.